

SAFETY & HEALTH HAZARDS ALERT

Assistant Secretary for Environment, Safety & Health • U.S. Department of Energy • Washington, D.C. 20585

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Potentially Defective Automatic Fire Sprinklers

The purpose of this notice is to provide you with information related to the discovery of conditions that may adversely affect the satisfactory performance of certain automatic fire sprinklers. In addition, this alert includes recommended actions that, if implemented at your facilities, will help avoid the adverse consequences of automatic sprinkler system failure during a fire or related event.

During the summer of 1998 Argonne National Laboratory-East discovered corrosion in automatic sprinkler heads that may render the heads inoperable in a fire situation. The sprinklers exhibiting the corrosion effect are the Reliable Model-A type of flush-mounted pendant sprinkler heads. A potentially defective O-ring seal in these sprinkler heads allows water to seep past and corrode the fusible link and cover plate, thus "cementing" the components together. Based on independent tests performed for the Laboratory, these corroded sprinklers exhibit a high failure rate resulting from the deflector failing to drop (e.g., the gasket appears to adhere to the orifice, maintaining the seal).

A summary and analysis of the phenomenon experienced at Argonne National Laboratory can be found in the Department of Energy (DOE) ORPS Report CH-AA-ANLE-ANLEESH-1998-0001. Electronic and paper copies of this report are available from Tim Tess (ANL-East) on 630-252-6183 (tjptess@anl.gov) Matt Cole (DOE-SC-83) on 301-903-8388 (matt.cole@science.doe.gov) or Dennis Kubicki (DOE-EH-51) on 301-903-4794 (dennis.kubicki@eh.doe.gov).

The above-noted occurrence comes on the heels of the October 14, 1998 announcement by the Consumer Product Safety Commission (CPSC) of the recall of over 8 million Omega Brand fire sprinklers manufactured since 1982 by Central Sprinkler Company. (Note that both the Reliable Model A and Central Omega sprinkler heads feature O-rings in their design.) Additional information on

the recall can be obtained from the CPSC's Web Site at: <http://www.cpsc.gov/cpsc/pub/prerel/prhtml99/99008.html>

On a related note, DOE's Kansas City Plant has observed instances of interior corrosion in Star, Model G sprinklers with a 165 degree (temperature) rating, manufactured in 1972. Additionally, in a series of incidents beginning in 1987 and culminating in the recent past, the Princeton Plasma Physics Laboratory and the Rocky Flats Environmental Technology Site collectively experienced 11 unexplained activations of Grinnell Model F-950 sprinkler heads in 9 different building areas. The heads were manufactured in 1978. No definitive conclusions can be drawn from these occurrences, however. Further testing and analysis are planned.

In light of the above, the following actions are deemed prudent and should be implemented as expeditiously as possible:

- Perform a survey of all facilities protected by automatic sprinklers with the purpose of discovering the presence of the Central Omega and Reliable Model-A sprinkler heads. This survey should focus on nuclear facilities, facilities which contain significant fire hazards (as determined by a qualified fire protection engineer), facilities protected with automatic sprinklers for life safety, and facilities with significant programmatic (fire) loss potential. The results of this survey should be reported to the appropriate DOE program and fire safety officials;
- Where Omega sprinklers are discovered, the process described by the CPSC to obtain replacements should be initiated. Pending receipt of replacement heads from the manufacturer, DOE contractors and non-contractor DOE field elements should initiate a unilateral replacement effort for facilities at risk.

Replacement may be with conventional sprinkler heads or another listed or approved flow control model.

- Where Reliable Model A sprinklers are discovered, representative samples should be tested for operability in accordance with their Underwriters' Laboratories listing or Factory Mutual approval requirements. The results of these tests should guide subsequent decisions regarding replacement.
- Pending replacement of sprinklers that are determined to be potentially defective, interim compensatory (fire safety) measures commensurate with the hazard should be implemented.
- All site fire protection system inspection, testing, and maintenance programs should feature routine exterior and interior (on the basis of samples) inspections of sprinkler heads.

- The results of these activities should be shared with other organizations and individuals within the DOE fire safety community via the fire protection LISTSERVER, which is accessible from the DOE Fire Protection Home Page, located at: <http://tis.eh.doe.gov/fire/>



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